



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,086	09/25/2003	Charles W. Alvord	2003P88063 US	6320

28524 7590 01/04/2007
SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER

GREENE, DANIEL LAWSON

ART UNIT	PAPER NUMBER
----------	--------------

3694

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/671,086

Applicant(s)

ALVORD ET AL.

Examiner

Daniel L. Greene Jr.

Art Unit

3694

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 37-49.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. Claims 37-49 are pending. Claims 37, 41-44 and 47-49 were amended in the response received 10/13/2006/

Response to Arguments

2. Applicant's arguments see Pages 5-9, filed 10/13/2006, with respect to sections 4-8 of the previous Office action mailed 6/13/2006 have been fully considered and are persuasive. Accordingly the objections and rejections of sections 4-8 of the previous Office action mailed 6/13/2006 have been withdrawn.

3. However Applicant's 10/13/2006 arguments regarding sections 10-13 of the previous Office action mailed 6/13/2006 have been fully considered but they are not persuasive. Accordingly said rejections are maintained and incorporated herein by reference as expounded upon below.

4. Regarding applicant's arguments (See page 9) against section 10 of said previous Office action, the limitation "within" is not considered as defining over the prior art as the cooling channels are indeed within the target body when the outer physical limits of the target body of the prior art are considered as the boundaries defining said target body. Resort may be had to the following figure as the arrow indicates the outer limits of the target body. Accordingly said channels (i.e. (302,304)) are indeed within said target body:

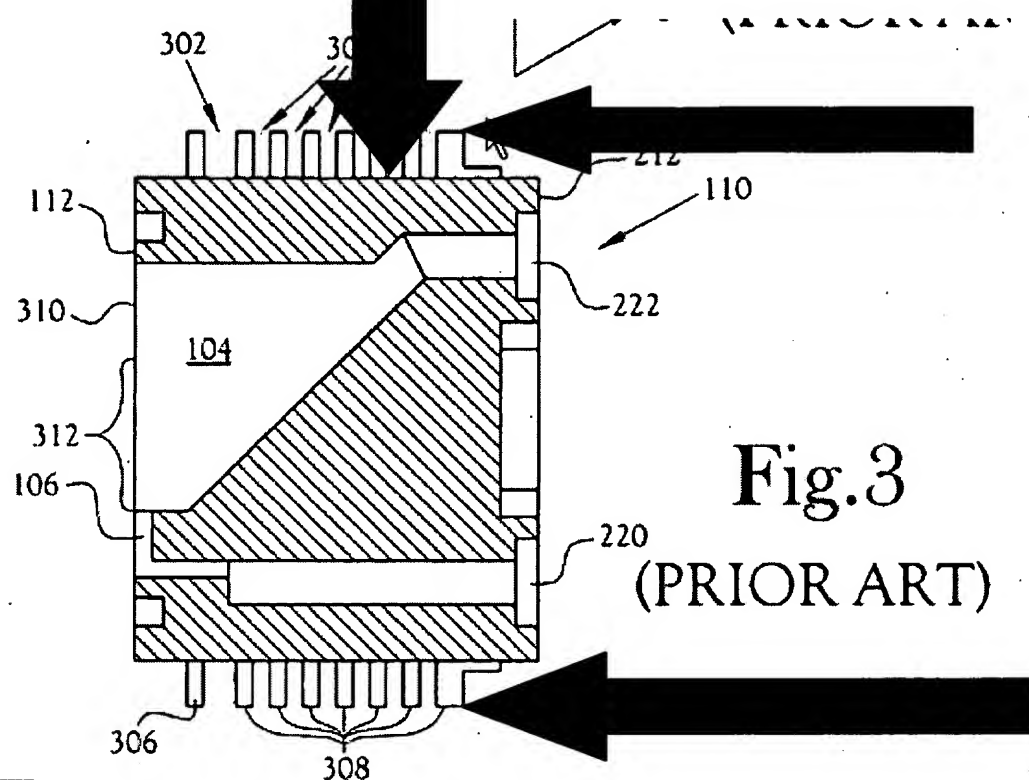


Fig. 3
(PRIOR ART)

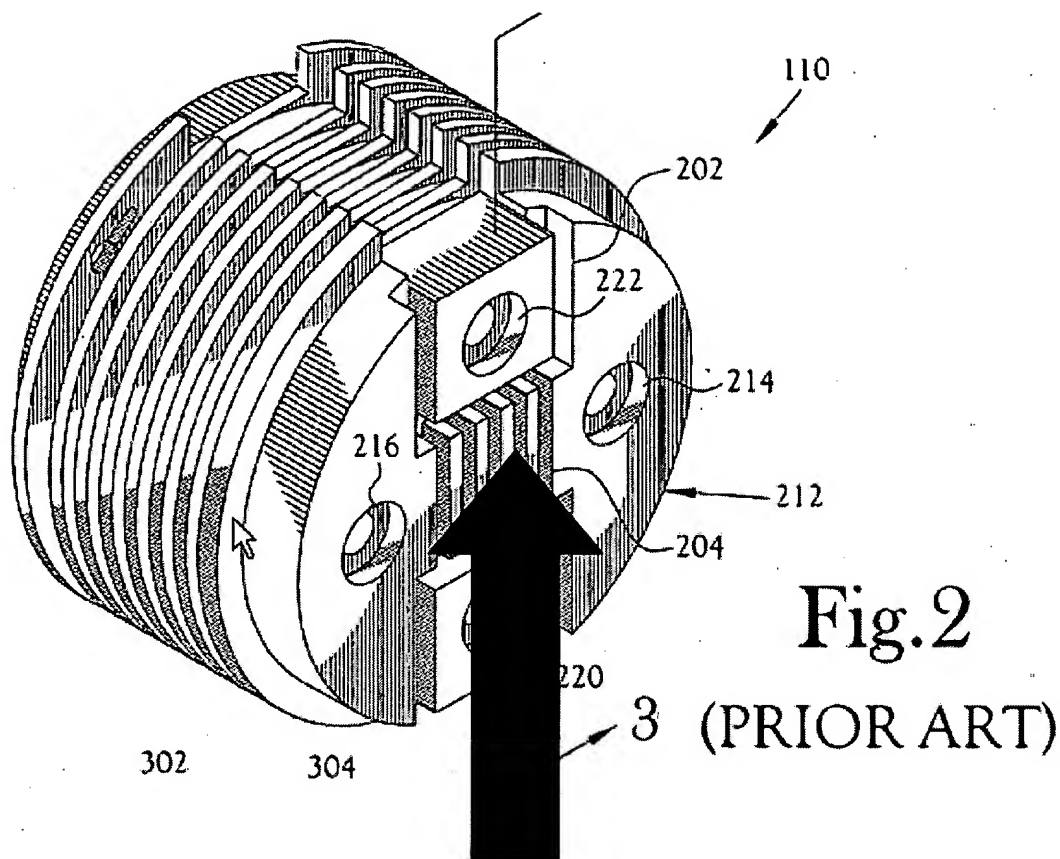
Applicant further argues:

"Additionally, the prior art target assembly does not contain a cooling channel running along at least a portion of a sloped rear wall of a target chamber as claimed. It is particularly unclear and not understood how the Examiner reads this limitation on the prior art target assembly, and the Office action provides no detail as to how such limitation could possibly be interpreted to read on the prior art assembly as disclosed in Figs. 1-3. "

This limitation can be read in multiple ways:

First, channels 302, 304 are within the circumference of the target body, accordingly the vertical arrow in Fig 3 above indicates a portion of the cooling channel running along a portion of the sloped rear wall.

Second the back of the target also has cooling channels that run alongside a portion of the sloped rear wall as shown in Fig. 2 below.



Again, as previously expressed by the examiner, the cooling channels of the prior art run along at least a portion of the rear wall just as two lanes of a divided highway run along each other, since applicant has failed to set forth the metes and bounds of the limitations "running along at least a portion of said rear wall" the examiners assertions are correct.

Although the claims are interpreted in light of the specification, limitations from the specification are NOT imported into the claims. The Examiner must give the claim language the broadest reasonable interpretation the claims allow.

See MPEP 2111.01, which states

While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim

Art Unit: 3694

interpretation to be applied during examination. During examination, the claims **must be interpreted as broadly as their terms reasonably allow**. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004).

5. Regarding section 11 of the previous Office action applicant argues:

"The rejection of claims 37-49 over Satyamurthy et al. is respectfully traversed. Fig. 1 of Satyamurthy discloses a cooling water chamber provided behind a target chamber, with a cooling water inlet tube entering one side of the cooling water chamber and being surrounded by a concentric cooling water outlet tube. There are no cooling fluid channel conduits formed within a target body or running along top and rear walls of a target chamber as required by the pending claims of this application. Instead, there is one large cooling water chamber formed adjacent to the target chamber. There are no cooling fluid inlets or outlets at respective ends of the target body. Instead the inlet and outlet are concentrically located and formed at one end of the cooling water chamber, not the target body. Reconsideration and withdrawal of this ground of rejection is respectfully urged." (Underlining added)

It appears Applicant has clearly disregarded the Examiners explanation set forth on pages 15-17 of the previous Office action and should review said pages and the ANNOTATED Satyamurthy figure that was attached to said office action.

Applicant's arguments are unpersuasive as applicant has not shown that the references do not teach **what the examiner has stated they teach**.

Further in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the cooling fluid inlets and outlets are at respective ends of the target body) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from

Art Unit: 3694

the specification are not read into the claims. See *In re Van Geuns*, 988

F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As applicant so aptly states in his 1013/2006 response page 9 "In the context of the specification, "end" means simply at an outside surface of the target body"

Satyamurthy's cooling channel inlet is indeed at one end of the target body and the outlet is at another end in the broadest sense of the limitation "end" as set forth by applicant.

Applicant's assertions regarding Satyamurthy disclosing only one large cooling chamber are in err, as that "chamber" can be considered to be a conglomeration of multiple channels, that is to say that that chamber could be cut into any number of channels.

6. Regarding applicant's arguments towards sections 12 and 13 it is noted that applicant merely lumped together his response to both sections without specifically addressing the Examiners contentions. Accordingly Applicant's arguments are unpersuasive as applicant has not shown that the references do not teach what the examiner has stated they teach, nor has applicant shown that the examiner's reasoning for and manner of combining the teachings of the references is improper or invalid.

Applicant is directed to page 18, first full paragraph through page 20 wherein the Examiner has indeed set forth what applicant asserts is missing, i.e.

"If applicant is of the opinion that APA does not disclose cooling fluid channel conduits formed in said target body, then any of the references above can be relied upon to show it is clearly known to those of ordinary skill in the art to utilize internal cooling channels to cool whatever portion of the target body needs cooling to ensure it doesn't overheat, warp, etc.

At the time of the invention it would have been obvious to one of ordinary skill to locate the cooling channels of APA internally within said target body for the benefits thereof, i.e. localized cooling, etc. as taught to be notoriously old and well known by the references above."

"Regarding claims 39 and 45, APA discloses applicant proposed invention substantially as claimed and described above, however **APA does not expressly disclose that the target body is fabricated out of tantalum.**

Satyamurthy et al. disclose that there has been more than two decades of ongoing development of cyclotron target bodies for the production of the ^{18}F fluoride ion and discusses the benefits and drawbacks of various materials in the fabrication of said target bodies. Satyamurthy et al. further teaches that the rationale for the choice of tantalum is its relatively low activation by protons and its general chemical inertness and it has a higher thermal conductivity than titanium (another typical target body material)

At the time of applicant's invention, it would have been obvious to one of ordinary skill in the art to fabricate the target body of APA out of tantalum for the benefits of relatively low activation by protons and its general chemical inertness as such is no more than functionally equivalent material.

Further basic thermodynamic principles of engineering can be relied upon to show that when you replace a material that has a high thermal conductivity with a material that has a low thermal conductivity, some method must be employed to account for the change in heat transfer. Accordingly extra or additional or rerouting of the cooling system must be employed.

Accordingly, it would have been obvious to move the cooling channels from the exterior of the target body to the interior in order to move the cooling system closer to the area where the heat is being produced." (Emphasis added)

7. Further, resort may be had to case law wherein it is OBVIOUS to integrate the cooling channels to the inside of the target body and it is further OBVIOUS to duplicate the cooling channels as such is nothing more than a duplication of parts performing the SAME FUNCTION, i.e. cooling.

See, for examples, In re Wolfe, 116 USPQ 443, 444 (CCPA 1961)), In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965), In re Harza, 124 USPQ 378 (CCPA 1960) "Mere duplication of parts has no patentable significance unless new and unexpected result is produced"

Art Unit: 3694

In this case, only additional cooling would be the result, which would not be unexpected.

8. Applicant is again directed to the Satyamurthy reference as evidence that those in the art are clearly aware of the use of Tantalum target systems including "continuous improvements of existing target bodies based on silver target bodies." It appears apparent that applicant has merely applied the teachings of Satyamurthy to his own prior art Target.

There has been an ongoing development of cyclotron target bodies during the past two decades for the production of [^{18}F]fluoride ion.⁴⁻¹⁸ To-date, the materials of choice for the construction of [^{18}F]fluoride ion target bodies are silver and titanium.^{8,19} Stainless steel and nickel plated copper have also found occasional use in [^{18}F]fluoride ion target fabrication.^{16,19} However, there are certain drawbacks in all these target systems. Irradiation of [^{18}O]water in silver target bodies with proton beam currents higher than 30 μA generally leads to formation of gray or black colloids which frequently clogs the [^{18}F]fluoride ion delivery lines. More importantly, the reactivity of the [^{18}F]fluoride ion thus obtained is severely diminished.¹⁶ On the other hand,

target bodies made of titanium and nickel are robust and handle even 40 μA beam current with ease. Daily ir-

Thus, there exists a need for new and more efficient [^{18}F]fluoride ion target systems as well as continuous improvements of the existing target bodies. Further,

Art Unit: 3694

Described herein is a recent development in our laboratories of a novel [^{18}O]water target made of tantalum for routine and efficient production of reactive, no-carrier-added [^{18}F]fluoride ion in Curie quantities.

Materials and Methods

The tantalum target system we have developed is shown schematically in Figure 1. This system is based on the silver high-pressure [^{18}O]water target for the production of [^{18}F]fluoride ion, commercially available from CTF Inc., Knoxville, TN. The manifold and the [^{18}O]water Cavo pump (Fig. 1) constitute the target

support unit. The design of the tantalum target body is also identical to the high-pressure silver [^{18}O]water target. Briefly, the target chamber has a semi-circular (10-

Results and Discussion

The material of choice for the construction of [^{18}O]water target bodies for the production of [^{18}F]fluoride ion is rather critical. Essentially two characteristics, namely, thermal conductivity and inertness towards the [^{18}F]fluoride ion, determine the suitability of a metal for the fabrication of [^{18}O]water targets. For example,

[^{18}O]water target bodies.^{3,19} Decreasing the wall thickness of a titanium target coupled with efficient target body cooling have offset the modest thermal conductivity of titanium ($21.9 \text{ Wm}^{-1}\text{K}^{-1}$). The long lived ^{48}V buildup in the target body and contamination of the [^{18}F]fluoride ion with ^{48}V isotope, however, still remain as major concerns. Irradiation of silver [^{18}O]water target bodies at high beam currents (e.g., $40 \mu\text{A}$) may cause a target failure.²³

To obviate some of these shortcomings of silver and titanium we have chosen the metal tantalum as a viable option for the construction of [^{18}O]water targets for the production of [^{18}F]fluoride ion. The rationale for the choice of tantalum is its relatively low activation by protons^{24,25} and its general chemical inertness.²⁶ The thermal conductivity of tantalum ($57.5 \text{ Wm}^{-1}\text{K}^{-1}$) is also higher than that of titanium.

Art Unit: 3694

In conclusion, a tantalum [^{18}O]water target body for the routine production of no-carrier-added [^{18}F]fluoride ion in Curie quantities has been developed. This target system seems to have the best characteristics from the standpoint of [^{18}F]fluoride ion recovery and its radiochemical reactivity and low induced activation. Preliminary results indicate that the same batch of [^{18}O]water could be repeatedly used and recycled in this target without the need for tedious distillation and purification processes that are required with other target systems.

Conclusion

9. Examiner's Note: Examiner has cited particular columns and line numbers in the references as applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 3694


extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James P. Trammell can be reached on (571) 272-6712. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DIG
2006-12-12


ELLA COLBERT
PRIMARY EXAMINER